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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/583,032   | 04/27/2007  | Stuart Grossart      | 4590-544            | 9133             |
| 33308  | 7590        | 05/27/2011           | EXAMINER            |                  |
| LOWE HAUPTMAN HAM & BERNER, LLP<br>1700 DIAGONAL ROAD, SUITE 300<br>ALEXANDRIA, VA 22314 |             |                      |                     | LOPEZ, FRANK D   |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/583,032             | GROSSART, STUART    |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | F. DANIEL LOPEZ        | 3745                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 12 April 2011.  
 2a) This action is **FINAL**.                  2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 34-56 and 58-60 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 34-56 and 58-60 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____.   | 6) <input type="checkbox"/> Other: _____ .                        |

***Response to Amendment***

Applicant's arguments filed April 12, 2011, have been fully considered but they are not deemed to be persuasive.

Applicant argues that the specification (e.g. page 4 line 10-12) is correct in that even though fluid does not flow to both the extend and retract chambers at the same time, they are connected to the supply of fluid at substantially the same pressure. Applicant is of the opinion that the specification does not require the fluid to enter the extend and retract chambers simultaneously. The examiner understands that the specification is reciting 2 different ideas: that the extend and retract chambers are simultaneously supplied fluid, and that the pressure in both chambers are substantially the same. The examiner also accepts that the second idea is correct (at least under certain conditions). But the first idea is not, because the system can only supply one of the chambers at a time, which the other chamber being emptied rather than being supplied. Therefore, the specification is misleading and needs to be changed.

Applicant argues that the limitations of claims 34 and 47, related to the above supply of fluid to both chambers is not unclear. The examiner agrees that claim 34 is clear and supported, since the pumps (fluid supply) can supply fluid to the chambers (at different times, just not simultaneously). But the step of claim 47 of "supplying pressurized fluid to both the extend and the retract chambers" (line 10) is not supported, because the system disclosed can not possibly supply fluid to both chambers as a single step (i.e. simultaneously). Therefore, the 112 rejection of claim 47 is maintained.

Applicant states that Hiraki et al teaches the pumps P1 and P2 being connected to a motor (MA), such that P1 removes fluid from 7S and P1 and P2 pressurize 7L. Applicant concludes that the pumps can't maintain the same pressure in 7L and 7S because the pressure differences are linked to the turning of the motor. The examiner is confused, because this works exactly the same as the instant invention. Pump A removes fluid from line 12 and pumps A and B move fluid to line 14, when motor 11 turns them.

One of ordinary skill in the fluid actuator art would analyze the forces acting on the piston and conclude that the pressure difference between the extend and retract chambers would depend on the external force (i.e. load) acting on the piston of Hiraki et al (or the instant invention). The force equation would be:  $F_l + P_r * A_r = P_e * A_e$ , where  $F_l$  is the load force,  $A_r$  and  $A_e$  are the areas of the retract and extend chambers, respectively, and  $P_r$  and  $P_e$  are the pressure in the retract and extend chambers. Recognizing that  $A_e = A_r + A_{rod}$  (where  $A_{rod}$  is the area of the rod) and with some manipulation, we see that  $(F_l - P_e * A_{rod}) / A_r = (P_e - P_r)$ . If the external force has a specific value (i.e.  $P_e * A_{rod}$ ), the extend and retract pressures will be identical. When the external force is close to the specific value, the extend and retract pressures will be substantially the same. And when the external force is far from the specific value, the extend and retract pressures will be very different. This is a characteristic of the system, and therefore inherent in the prior art systems.

The above analysis applies to both Hiraki et al and Nikolaus. Therefore, this limitation, that the pressures of both extend and retract chambers are substantially the same, is not allowable.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Specification***

The disclosure is objected to because of the following: the specification states (e.g. page 4 line 10-12) "supplying fluid simultaneously to both the extend and retract chambers of a double acting differential actuators at substantially the same pressure", which appears to be wrong. The system can only supply fluid to the extend chamber or the retract chamber, at any given time, since the pumps (A, B) can supply fluid to the retract chamber while pulling fluid from the extend chamber, or supply fluid to the extend chamber while pulling fluid from the extract chamber. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

Claims 47-56 and 58 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 47 line 10-11 “supplying pressurized fluid to both the extend and the retract chambers” appears to be wrong. The pump supplies fluid to one chamber from the other. There is no operation where both chambers are supplied fluid (i.e. at the same time).

Claims 48-56 and 58 are indefinite, since they depend from claim 47.

***Claim Rejections - 35 USC § 102***

Claims 34-45, and 47-56, inasmuch as they are definite, are rejected under 35 U.S.C. § 102(b) as being anticipated by Hiraki et al. Hiraki et al discloses an actuator and method of using comprising a piston in an actuator chamber defining extend (PL) and retract (PS) chambers, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump (P1) arranged to reversibly transfer fluid between the extend and retract chamber and a second reversible pump (P2) arranged to transfer fluid between the extend chamber and a hydraulic accumulator (10); wherein a pressure in the extend chamber is substantially the same as in the retract chamber, and is based on a difference in area between the extend and retract chamber areas, and a load applied to the actuator (inherent, see discussion above).

Claims 34-38, and 47-56, inasmuch as they are definite, are rejected under 35 U.S.C. § 102(b) as being anticipated by Nikolaus. Nikolaus discloses an actuator and method of using comprising a piston (18) in an actuator chamber defining an extend (13) and a retract (11) chamber, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump (15) arranged to reversibly transfer fluid between the extend and retract chamber and a hydraulic accumulator (16) holding fluid transferred from the extend chamber.

***Claim Rejections - 35 USC § 103***

Claim 46, inasmuch as it is definite, is rejected under 35 U.S.C. § 103 as being unpatentable over Hiraki et al in view of Nikolaus. Hiraki et al discloses all of the elements of claim 46, as discussed in the above 102 rejection; but does not disclose a fluid supply in communication with the accumulator and the second pump.

Nikolaus teaches, for an actuator comprising a piston (18) in an actuator chamber defining an extend (13) and a retract (11) chamber, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump (15) arranged to reversibly transfer fluid between the extend and retract chamber and a hydraulic accumulator (16) holding fluid transferred from the extend chamber; that a fluid supply is connected to the accumulator, for the purpose of maintaining a constant pressure in the accumulator (column 3 line 63-65).

Since Hiraki et al and Nikolaus are both from the same field of endeavor, the purpose disclosed by Nikolaus would have been recognized in the pertinent art of Hiraki et al. It would have been obvious at the time the invention was made to one having ordinary skill in the art to connect a fluid supply to the accumulator of Hiraki et al, as taught by Nikolaus, for the purpose of maintaining a constant pressure in the accumulator. Since the second pump is connected to the accumulator, the supply would also be connected to the second pump.

Claims 34-45, 47-56 and 58-60, inasmuch as they are definite, are rejected under 35 U.S.C. § 103 as being unpatentable over Applicant's admitted prior art in view of Hiraki et al and MacLeod. Applicant's admitted prior art discloses a vehicle motion simulator and method of using comprising a motion platform (3, fig 1) moved by actuators (2) which are controlled by servo valves (page 1 line 25-26); but does not disclose that the actuator includes a piston in an actuator chamber defining an extend and a retract chamber, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump arranged to reversibly transfer fluid between the extend and retract chamber and a second reversible pump arranged to transfer fluid between the extend chamber and a hydraulic accumulator.

Hiraki et al teaches that an actuator controlled by a reversible pump and method of using can include a piston in an actuator chamber defining extend (PL) and retract (PS) chambers, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump (P1) arranged to reversibly transfer fluid between the extend and retract chamber and a second reversible pump (P2) arranged to transfer fluid between the extend chamber and a hydraulic accumulator (10).

MacLeod teaches replacing a control of an actuator (54, 56) with a servo valve (34, fig 2), with a control using a reversible pump (72, fig 3), for the purpose of eliminating complex and costly intervening valving (column 1 line 25-28), and to have a system that is accurate, relatively insensitive to leakage and reliable in use (column 1 line 32-34)

Since the actuator of Applicant's admitted prior art is controlled by a servo valve; since MacLeod teaches advantages of using a reversible pump, instead of a servo valve, to control an actuator and since Hiraki et al teaches details of a reversible pump control of an actuator; it would have been obvious at the time the invention was made to one having ordinary skill in the art to control the actuator of Applicant's admitted prior art, such that the actuator includes a piston in an actuator chamber defining an extend and a retract chamber, such that an actuator rod extends through the retract chamber; a fluid supply means, including a first reversible pump arranged to reversibly transfer fluid between the extend and retract chamber and a second reversible pump arranged to transfer fluid between the extend chamber and a hydraulic accumulator, as taught by Hiraki et al, for the purpose of eliminating complex and costly intervening valving, and to have a system that is accurate, relatively insensitive to leakage and reliable in use, as taught by MacLeod.

The portions of the limitation concerning maintaining the fluid in the extend and retract chambers at a same pressure, which is definite, is inherent in the system formed by the combination of references.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Lopez whose telephone number is 571-272-4821. The examiner can normally be reached on Monday-Thursday from 6:00 AM -4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look, can be reached on 571-272-4820. The fax number for this group is 571-273-8300. Any inquiry of a general nature should be directed to the Help Desk, whose telephone number is 1-800-PTO-9199.

/F. Daniel Lopez/  
F. Daniel Lopez  
Primary Examiner  
Art Unit 3745  
May 26, 2011